Ohio Environmental Protection Agency

John R. Kasich, Governor
Mary Taylor, Lt. Governor
Craig W. Butler, Director

March 20, 2017

Mr. D. Erik Hardin,
Remedial Project Manager
U.S. EPA, Region 5 (SR-6J)
77 W. Jackson Boulevard
Chicago, Illinois 60604

Re: Behr Dayton Thermal Products LLC, Dayton
Remediation Response
Plans
Remedial Response
Montgomery County
557002391008

Subject: Ohio Environmental Protection Agency (Ohio EPA) Remedial Investigation Review; Second Draft - Remedial Investigation Report, Behr Dayton Thermal System VOC Plume Site

Dear Mr. Hardin:

On January 27, 2017, Ohio EPA, Division of Environmental Response and Revitalization, received the second draft of the Remedial Investigation Report, Behr Dayton Thermal System VOC Plume Site submitted by CH2M, on behalf of U.S. EPA, for the site known as the Behr Dayton Thermal System VOC Plume. Ohio EPA is providing the following comments to assist in the completion of an approvable document. Please see the enclosed comments.

If you have any questions, or would like to discuss the comments, please contact me at (937) 285-6054 or Leslie.Williams@epa.ohio.gov.

Sincerely,

Leslie Williams, Site Coordinator
Division of Environmental Response and Revitalization

LW/ls

Enclosure

ec: Jeffrey Martin, Environmental Specialist 3, DERR-CO
Mark Rickrich, Environmental Manager, DERR-CO

Remedial Investigation Report, Behr Dayton Thermal System VOC Plume Site Behr Dayton Thermal Products LLC, Dayton Ohio EPA Comments: March 15, 2017

General Comments on Remedial Investigation (RI) Report

1. *Vapor Intrusion (VI) Data Gap Within the Remedial Investigation (RI) Report.*

The Baseline Human Health Risk Assessment (BHHRA) (p. 6-7) states, "the primary purpose of the RI report is only to demonstrate the extent of the ground water plume that exceeds Vapor Intrusion Screening Levels and comparison of that extent to the parcels that were reported to have been sampled through 2014" and that "further vapor intrusion evaluation of the parcels within the study area will be completed by EPA under separate administrative orders."

Prior to finalizing the RI and Feasibility Studies (FS), Ohio EPA requests supplemental investigation and mitigation as necessary. Ohio EPA is concerned about the implementation of VI evaluation outside of the RI/FS process for the following reasons:

a. Nature and Extent in the RI

According to U.S. EPA's "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA" (1988), "the final objective of the field investigations is to characterize the nature and extent of contamination such that informed decisions can be made as to the level of risk present by the site, and the appropriate type(s) of remedial response. This process involves using the information on source location and physical site data... to give a preliminary estimate of the locations of contaminants that may have migrated. An iterative monitoring program is then implemented so that, by using increasingly accurate analytical techniques, the locations and concentrations of contaminants that have migrated into the environment can be documented."

For the reasons outlined in Comment 10 of Ohio EPA's November 1, 2016 letter, Ohio EPA considers the VI area of concern based on the ground water Vapor Intrusion Screening Levels (VISL) for trichloroethylene (TCE) to be "a preliminary estimate of the locations of contaminants that may have migrated." The subsequent "iterative monitoring program.... using increasingly accurate analytical techniques" such as exterior soil gas, sub-slab vapor, and indoor air sampling, has occurred under the Time Critical Removal Action (TCRA), but has not been completed, nor incorporated, into the RI. Ohio EPA does not have an oversite role concerning the activities in the TCRA. Therefore, Ohio EPA requires the ability to review VI data through the RI. Because determining nature and extent is a critical component of the RI, the nature and extent of VI represents a significant data gap.

Remedial Investigation Report, Behr Dayton Thermal System VOC Plume Site
Behr Dayton Thermal Products LLC, Dayton
Ohio EPA Comments: March 15, 2017

b. The RI/FS Process

The response to Ohio EPA's Comment 8 states, "The evaluation and response actions to address VI are ongoing throughout the study area through the EPA TCRA. The details of the ongoing evaluation and remedial action are not included in the RI because the RI is conducted to evaluate conditions and assess whether there is a need for further action. The RI has completed this task and confirmed that there is a need to address VI. Additional evaluation of VI at specific parcels will continue to be completed by EPA under the separate TCRA administrative order".

U.S. EPA recently identified 300+ tax parcels (the number of buildings is unclear) that may require additional VI sampling through RI activities and the requirements laid out within the Screening Level Human Health Risk Assessment from 2013. Prior to finalizing the FS, these locations should be addressed. This effort is critical because (a) VI poses a current on-going risk and (b) ground water remedies will not be effective at mitigating VI in the short-term. In addition, because ground water remediation may temporarily effect VI conditions, it is important to consider ground water and VI mitigation together. Ohio EPA is concerned that separating the VI investigation and mitigation from the FS and subsequent actions, may result in disconnected remedial efforts that may not be protective of human health and the environment.

Therefore, the FS should include a mechanism to investigate and/or mitigate, if necessary, buildings that are not evaluated in the TCRA, and include specific Remedial Action Objectives for the VI pathway. The RI should be revised to reflect either how that the VI pathway will be carried forward, or be postponed to include the results of the completed VI study.

c. Concerns regarding the TCRA

In addition to the above concerns about the RI/FS process, the TCRA appears to be insufficient to address all of Ohio EPA's VI concerns for the following reasons.

i. Unacceptable TCE concentrations are present in indoor air at an unknown number of industrial facilities as the TCRA relies on Occupational Safety and Health (OSHA) permissible exposure limit (PELs) rather than screening levels considered to be protective of human health by both U.S. EPA and Ohio EPA. (Please see Ohio EPA Comment 9 of Ohio EPA's November 1, 2016 letter.) OSHA PELs may not be applicable to facilities that don't use TCE.

Remedial Investigation Report, Behr Dayton Thermal System VOC Plume Site
Behr Dayton Thermal Products LLC, Dayton
Ohio EPA Comments: March 15, 2017

ii. It is unclear if Ohio EPA's VI concerns regarding the facility buildings (Behr, Aramark, and Gem City) will be addressed under the TCRA. (Please see Ohio EPA Comments 8 and 9 of Ohio EPA's November 1, 2016 letter.)

iii. The TRCA does not consider Ohio EPA's "Recommendations Regarding Response Action Levels and Timeframes for Common Contaminants of Concern at Vapor Intrusion Sites in Ohio" (2016). (See Ohio EPA Comment 9 of Ohio EPA's November 1, 2016 letter.)

iv. Ohio EPA's Comment 10 of Ohio EPA's November 1, 2016 letter described inconsistencies between the VI area of concern based on ground water VISLs versus the buildings historically requiring mitigation under the FS. As a result, the potential underestimation of risk due to VI was added to the uncertainty section of the BHHRA. It is unclear if this investigative process to define the extent of unacceptable VI risk will take place in the removal action.

v. The BHHRA (p. 7-4) determined that "TCE and PCE represent contaminants of concern in ground water for the VI pathway that will be addressed further as part of the Non-Time Critical Removal Action and the FS." This contradicts other statements in the revised RI regarding the VI pathway being addressed as part of the removal actions. In addition, it is not clear if the TCRA directly addresses Tetrachloroethylene (PCE) and other volatile organic compounds (VOCs), as only TCE levels are provided in the 2009 administrative order.

vi. Operation and Maintenance (O&M) requirements under the TCRA appear to be based on initial inspections of indoor air and sub-slab concentrations, followed by inspection of the Sub-Slab Depressurization Systems (SSDS) to be functional. Long-term considerations of SSDS O&M should be considered and evaluated prior to remedy selection as Ohio EPA will be responsible for 100% of the long-term O&M cost if this remains a fund lead project, and Ohio EPA was not party to the TCRA. The long-term expectations for removal action are currently unclear.

Through discussions with U.S. EPA, Ohio EPA is aware that the large VI data gap will be investigated. Please share the Statement of Work once it is approved. Please maintain up to date contact with Ohio EPA on sampling efforts and progress made in the delineation of the VI issue. Please consider the above concerns as items to be addressed in additional edits of the RI and/or in future efforts.

Remedial Investigation Report, Behr Dayton Thermal System VOC Plume Site
Behr Dayton Thermal Products LLC, Dayton
Ohio EPA Comments: March 15, 2017

2. *Clarification Regarding the TCRA*

The RI (p. IV) was revised to state that Behr is addressing only some VI through the TCRA and alludes to this multiple times. Please elaborate on what this means within the text by summarizing important details of the TRCA such as but not limited to:

a. Difference in TCE standards for commercial/industrial facilities compared to the residential facilities

b. The process for selecting buildings mitigation and the subsequent sampling activities that took place

c. Explain the extent to which the TRCA will be ongoing

d. Describe limits that the TRCA may have in determining the nature and extent of the VI pathway (see general Comment 1)

3. *Mann-Kendall Tests*

A majority of the wells used for the Mann-Kendall tests are located on the Behr property, described in the RI as a source zone. Therefore, the conclusions from the Mann-Kendall test cannot be applied to the plume as a whole. There is not enough spatially relative data to show that the plume is stable or diminishing; it shows only that the contamination on the Behr property is stable or diminishing. Please adjust the text to describe conditions solely on the Behr property in regard to the Mann-Kendall tests. In addition, please remove any language that states this analysis shows the plume is stable or decreasing as this is inconsistent within the RI. Ohio EPA does see this analysis as useful, and would like it to be applied to the extent of the entire plume, especially to fringe areas of the plume, once a robust data set is available. Currently, the data can be used in conjunction with the plume delineation maps to determine hot spot areas.

Based on verbal discussions with U.S. EPA, the RI report will continue to include trend data from the Mann-Kendall test section. Upon Ohio EPA's review, the following specific concerns were noted. (Please see Ohio EPA's Comment 3 of Ohio EPA's November 1, 2016 letter.)

a. The trend maps (Figures 4-42A, 4-42B and 4-42C) were not consistent. Figure 4-42B appears to be the inconsistent map. Figure 4-42B does not accurately identify well PZ-038I with an increasing trend (red). Well PZ-8I was statistically evaluated as an increasing trend (red), but is illustrated as a stable (green). Please correct these errors on the figure(s).

b. Well PZ-024I is illustrated with TCE decreasing (Figure 4-42A), however PCE is increasing in this well (Mann-Kendall Analysis). Figure 4-42-B does not accurately show PCE as an increasing trend, although this may be result of the legend error. Please include a discussion regarding well PZ-024I which has a decreasing TCE trend, but increasing PCE trend.

c. It is not clear which "two well locations along the western boundary and west of Behr indicate increasing trends"; please identify these wells in the text (p. 4-13).

d. PZ-81 appears to be a typo on p. 4-13, the hot spot well along the southern boundary of Behr is PZ-8i.

e. The statistical evaluation for outliers was not conducted. Ohio EPA found at least one outlier for the TCE result of 0.1 micrograms per liter (µg/L) in well MW-33S reported for July 1, 2007. As part of the statistical analysis, outlier testing should be conducted on all results, and outlier(s) removed from analyses or explained, if retained.

Ohio EPA believes that the trend analyses have not been thoroughly evaluated because of the concerns identified above, and in previous comments.

4. The RI acknowledges the shallow plume is not completely defined (Please see Ohio EPA's Comment 4 of Ohio EPA's November 1, 2016 letter). Ohio EPA is concerned that no additional work is proposed in the following areas:

   a. The northern plume extent:

      The area is in a saddle point (flat gradient) and ground water divide. This divide has moved over time depending of the pumping rates of the city of Dayton's Miami South wellfield. In addition, the following specific items have been identified:

      i. The plume is drafted with dashed contour lines indicating incomplete definition.

      ii. Well MW-68S-COD, located in the center of this area, does not appear to have provided representative ground water samples and was documented as the source of several uncertainties in the BHHRA.

      iii. The city of Dayton indicated an open loop geothermal well for a commercial property has operated in this area. This should be verified and discussed in the text.

iv. The concentration of TCE (93 µg/L) at well E-16 is higher than any other well measured, either 2,000 feet up gradient, or 2,000 feet downgradient of this well, which warrants further discussion and/or investigation.

b. Determination of the TCE extent in southern portion of shallow plume at the Great Miami River boundary and wells TW-15 and MW-209S.

c. Ohio EPA noted well MW-209S (130 µg/L TCE) in Kettering Park, appears to be the only well in this area with elevated TCE concentrations. Without confirmation sampling, this may represent a localized plume rather than part of the extended Behr plume. Based on the ground water contouring, Ohio EPA requests that the contouring around well MW-209S be reevaluated as a possible isolated pocket and/or, resample well MW-209S to confirm the TCE concentration.

Ohio EPA believes, that as a part of the RI, the plume extent should be defined in all areas in order to design an efficient remedy. In the northern section, there are existing city of Dayton monitoring wells that could be used to better delineate plume boundaries.

5. As stated above, concerns still exist with the delineation of the plume to the north (see Comment #4). Results from well MW-68S-COD are used and shown on the 2012: TCE, cis- 1,2 dichloroethylene (DCE), trichloroethane (TCA), and vinyl chloride (VC) maps (Figures, 4-13, 4-14, 4-15, 4-16, & 4-17). CH2M has included language in the risk evaluation, that the uncertainty associated with the sample from MW-68S-COD, would not change whether data from MW-68S-COD are or are not included in the risk calculations. However, this uncertainty is not illustrated on maps that use data from well MW-68S-COD showing rate and extent. Given the number of uncertainties associated with this well, Ohio EPA requests data from well MW-68S-COD not be used to contour VOCs. Additionally, 2012 concentrations shown on the TCE, cis 1,2 DCE, TCA, and VC maps (Figures, 4-14, 4-15, 4-16, & 4-17) should be removed, and the maps redrafted. (Please see Ohio EPA's Comment 7 of Ohio EPA's November 1, 2016 letter.)

6. Please consider adding additional information about the migration of the ground water divide. Monitoring wells MW67S-COD and MW68S-COD were reported by the city of Dayton as having contamination detected in the early 2000s, and were not contaminated in the 1990s. As stated above, the city of Dayton changed their pumping rate based on reduced demand beginning in 2007, following the loss of manufacturing facilities. Within 4-5 years, the rate of pumping decreased by 27%. This caused the ground water divide to migrate north to its presumed current location.

Remedial Investigation Report, Behr Dayton Thermal System VOC Plume Site
Behr Dayton Thermal Products LLC, Dayton
Ohio EPA Comments: March 15, 2017

Please add this information to the RI as it is relevant to the ground water divide, and potential migration of contaminants. This may be a critical point in regard to Section 5.4, Conceptual Site Model.

7. The RI includes additional text in Section 4.3.2 stating, soil could not be collected beneath existing buildings at the facilities. The RI states in Appendix A, Section 6.1, that a soil investigation beneath a building may be warranted in the future should a building be razed. The RI does not indicate how this would be implemented, nor has it documented this requirement in a covenant or deed restriction. The expense, trust fund, and/or cost recovery of this future investigation, is not adequately addressed.

   Ohio EPA recommends including additional information regarding how the future protectiveness in these areas will be addressed. Include when and how this would be implemented and funded. (Please see Ohio EPA's Comment 15 of Ohio EPA's November 1, 2016 letter.)

8. Please describe the depths that define the shallow, intermediate, and deep portions of the upper aquifer within the text.

9. Currently, the upper and lower aquifers are used for geothermal applications, and future use of geothermal pumping, should be included in the RI. Please address this is the RI. As an example, Globe Motors runs a geothermal unit in the upper aquifer and MW-71s-COD has detections of TCE.

10. Ohio EPA requests Table 2-11 include the screen length and aquifer location (shallow, intermediate, or deep) for the wells listed. Ohio EPA requests well construction information be summarized for any well used to determine rate and extent for the aquifer, which may be as many as 259 wells based on the "site-wide" evaluation (p. 4-8). Additionally, Ohio EPA recommends grouping the wells by owner/facility for ease in review and reference, and provide the logs in Appendix F. Please include a discussion regarding whether the results reported from the rate and extent wells, including those installed by others, are representative of aquifer zone(s) in which they are screened. (Please see Ohio EPA's Comment 5 of Ohio EPA's November 1, 2016 letter.)

11. Figure 3-4, the Deep Potentiometric Surface Map, uses wells that are both in the lower aquifer and wells determined to be in the deep portions of the upper aquifer. The wells in the lower aquifer are KEID, GMR, CP2D, and G3D. This is not an accurate approach for determining ground water flow in the deep portion of the upper aquifer due to the existence of the basal clay layer, and because the lower aquifer is pumped by the city of Dayton. Please amend Figure 3-4 to only include wells located in the deep portion of the upper aquifer.

Remedial Investigation Report, Behr Dayton Thermal System VOC Plume Site
Behr Dayton Thermal Products LLC, Dayton
Ohio EPA Comments: March 15, 2017

12. Ohio EPA does not concur with the 2012 TCE plume map as drawn in Figure 4-24. CH2M states the map is what was understood in 2012 and the delineation will remain dashed, connecting wells MW-48D-COD and well MW-5D. Ohio EPA believes there is insufficient data to illustrate the deep plume connects wells MW-48D-COD and well MW-5D which are more than 3,400 feet apart, and across a saddle point area that has been interpreted as a ground water divide. Therefore, Ohio EPA requests these two wells be shown as two isolated plumes in a revised Figure 4-24. (Please see Ohio EPA's Comment 25 of Ohio EPA's November 1, 2016 letter.)

13. Within the RI, please explain the changes to the investigation area over time relative to Figure 4-45a, 4-45b, and 4-46. For example, VI mitigation systems are installed in several apartments near Kettering Park in Figure 4-45a, but not 4-45b. The reader could then look at Figure 4-46 to see that buildings no longer exist in this area, however, the order of construction vs. demolition may still be unclear.

14. The VI Area of Concern (AOC) overlay appears to be shifted relative to the aerial photo in Figure 4-45B when compared to Figures 4-44, 4-45a, and 4-46. The legend of Figure 4-46 obscured the view of a VI AOC that has not been sampled. Please try to reorient the overlay or legend of maps as needed.

15. Ohio EPA suggests revising the RI, and its figures, to consistently describe non-site related impacts. For example, the RI (see p. 4-14) states Figure 4-44 includes "two additional areas attributed to two separate releases of TCE." However, Figure 4-44, as well as Figures 4-45a, 4-44b, and 4-46, refers to these as "VISL exceedances potentially attributed to non-site related ground water plume." Figure 4-28 shows only one of the two non-site related plumes as non-site related. Figure 4-41A shows TCE Mann Kendall results that appear to include both non-site related plumes. The text, figures, and models should clearly and consistently state whether or not these plumes are site-related, as determined by the data collected during the RI.

16. Ohio EPA is concerned about areas and properties on the southeast and south portions of the delineated plume. Houses with known SSDSs are excluded for the area of concern in the southern portion of the VI AOC (see Figure 4-45a and 4-45b), and as stated above, the detections in well MW-209s could be an isolated patch of contamination not connected to the larger plume (see Figure 4-28). Please review the data and adjust the southern edge, or justify within the text, why these mitigated houses and the plume boundary are delineated in such a manner.

Remedial Investigation Report, Behr Dayton Thermal System VOC Plume Site
Behr Dayton Thermal Products LLC, Dayton
Ohio EPA Comments: March 15, 2017

17. Additional Maps

The "Conclusions" section mentions the aquifer appears to be reductive, but no data is provided to support this. Therefore:

a. Please provide a map of wells used for Natural Attenuation parameters, and indicted what trend may be occurring (mark wells with iron-reducing conditions and mark wells with a statistically significant increase in chloride).

b. Please also include maps delineating Oxidation-Reduction Potential and dissolved oxygen parameters measured in the field during sampling as this may affect the selection of hot spot remedies presented within the FS.

c. Within the text, please include a discussion of the total organic content of the aquifer as this may influence the selection of hot spot remedies.

d. Please include on a map, the locations for the wells that were sampled to determine the contamination of the lower aquifer.

All of the information requested is necessary for determining a viable remedy for the aquifer.

18. Please include the city of Dayton in all future reviews and site based discussions. They are an important stakeholder, and their extensive and detailed historical knowledge of the aquifer is valuable.

Specific Comments on [Work Plan or Report

1. Within Section 1.3, please include the following:

a. In 2008, Ohio EPA requested that Behr provide data on their subsurface injections, or discontinue them due to concerns that off-site migration was occurring. Please include this detail, and review this section as dates describing the extent of the ground water treatment within the text are not in agreement with our records.

b. In Section 1.3.3.2, it states that the off-site soil vapor extraction (SVE) system was discontinued. To our knowledge, it is still running today. Please review this section. Also, add information on why the SVE system had to be installed.

c. Please add language stating that Aramark was never under any Ohio EPA oversite. Aramark did reach out to Ohio EPA for assistance, but at the time, we did not have the resources to support their efforts.

Remedial Investigation Report, Behr Dayton Thermal System VOC Plume Site
Behr Dayton Thermal Products LLC, Dayton
Ohio EPA Comments: March 15, 2017

An example Source Control Interim Action was provided to them as an model of how their efforts could be completed.

d. Please include within Section 1.3.5, that Ohio EPA became aware of contamination in ground water at the Gem City Chemical in 1989, during a regional investigation of the sources of VOC contamination in Dayton's Mad River Well Field. On July 6, 1992, Ohio EPA and Gem City Chemicals entered into an Administrative Order on Consent in which Gem City Chemicals agreed to "prevent the further off-property migration of contaminants from the Facility."

2. Within Section 3.6, Ohio EPA requests a re-evaluation of the site-specific hydrogeology which reported a "steep hydraulic gradient to the northwest (north of Janney Road)." Based on the shallow potentiometric map (Figure 3-2) the gradient appears to be north with a slight northeast component of flow rather than northwest.

3. Please note well MW-119-COD is a DAP well (MW-119), not a city of Dayton well, please remove the COD suffix. Be advised well MW-119 may be screened in a perched zone rather than the shallow zone of the upper aquifer indicated on Figure 3-2. Please consider using DAP well JW-4 screened in the shallow gravel (29-39' bls), when redrafting the shallow potentiometric surface in this area. Also, consider eliminating well MW-68S-COD from the potentiometric map because of the seven feet of silted screen, high turbidity, and possible poor hydraulic communication, with the sand and gravel aquifer.

4. Laboratory analytical reports that were inadvertently omitted from the draft RI were subsequently provided electronically, however, one of these reports was found to be incomplete. Ohio EPA could not locate the lab narrative, Quality Assurance/Quality Control (QA/QC) data, chain of custody, or complete report (i.e., Level 4 data) for ground water samples collected August 2012. Please provide the missing analytical data for August 2012. (Please see Ohio EPA's Comment 1 of Ohio EPA's November 1, 2016 letter.)

5. Within Section 5.1, high volatility should be defined as high (not low) vapor pressures and a high Henry's Law Constant.

6. Within Section 6.1.1, the sentence, "Indoor air and sub-slab vapor data were collected as part of the removal action between 2006 and 2011 from buildings..." may imply that the removal action was completed in 2011, but it is still ongoing. Please clarify within the text.

7. Within the BHHRA, in Section 4 and 7, please amend the texts so it reads that "Conclusions" are components of the RI, not the BHHRA.

Remedial Investigation Report, Behr Dayton Thermal System VOC Plume Site
Behr Dayton Thermal Products LLC, Dayton
Ohio EPA Comments: March 15, 2017

8. Tables 4-7 and 4-8 were revised to include additional qualifiers with shading to denote maximum contaminant levels exceedances. Additional text was added to Section 2.4.3, referencing data collected in 2015. The laboratory analytical reports that correspond to the added text were not included, making the response incomplete. The QA/QC concerns addressed appear to be limited to data collected in 2015. QA/QC concerns for data collected in 2012 remain unaddressed. Please include a QA/QC discussion for data collected in 2012. (Please see Ohio EPA's Comment 2 of Ohio EPA's November 1, 2016 letter.)

9. As mentioned above, there is an area with installed SSDS systems in the southernmost area depicted on Figure 4-44, but is not included within the VI AOC. Please add language to Section 4.5 to explain why this area is excluded from the VI AOC, or revisit the data and redraw the VI AOC boundary.

10. Figure 4-45a should clarify that the "No Further Action" status of industrial properties is based on OSHA PELs, not health-based risk levels used by U.S. EPA and Ohio EPA.

11. The text references Figure 5-1, but the figure is labeled ES-2. Please amend either the text or the figure.

12. Please include contamination concentrations within cross-sectional maps of Figures 3-1a, 3-1b, and 3-1c, adjacent to screen intervals.

13. In Figure 3-1a, the distance between MW-50D-COD and MW-5 is around 5,000 feet. Please include some indication of uncertainty with this portion of the aquifer.